

**Appendix P**  
**Other Screened Dredging Technologies**



**FIGURE P-1. BELLC BONACAVOR. BAYOU BONFOUCA, SLIDELL, LOUISIANA**

# PROFILING GRAB



## Efficient dredging of polluted bed material

The **profiling grab**, which has a horizontal closing action, is an efficient dredging tool developed by Boskalis for the removal of polluted bed material in ports and waterways. Great accuracy is required for this type of selective dredging. If dumping or processing costs are to be contained, only polluted spoil must be removed and not the uncontaminated material which should be left in space.

The profiling grab is designed to dredge in layers (the thinnest layers if necessary) and without spillage or muddying of the water. The volume to be recovered or processed is consequently kept to a minimum.

Polluted bed material often contains substantial quantities of large items of rubbish. Fitted with a hydraulic crane, the profiling grab has no difficulty in handling this kind of waste.

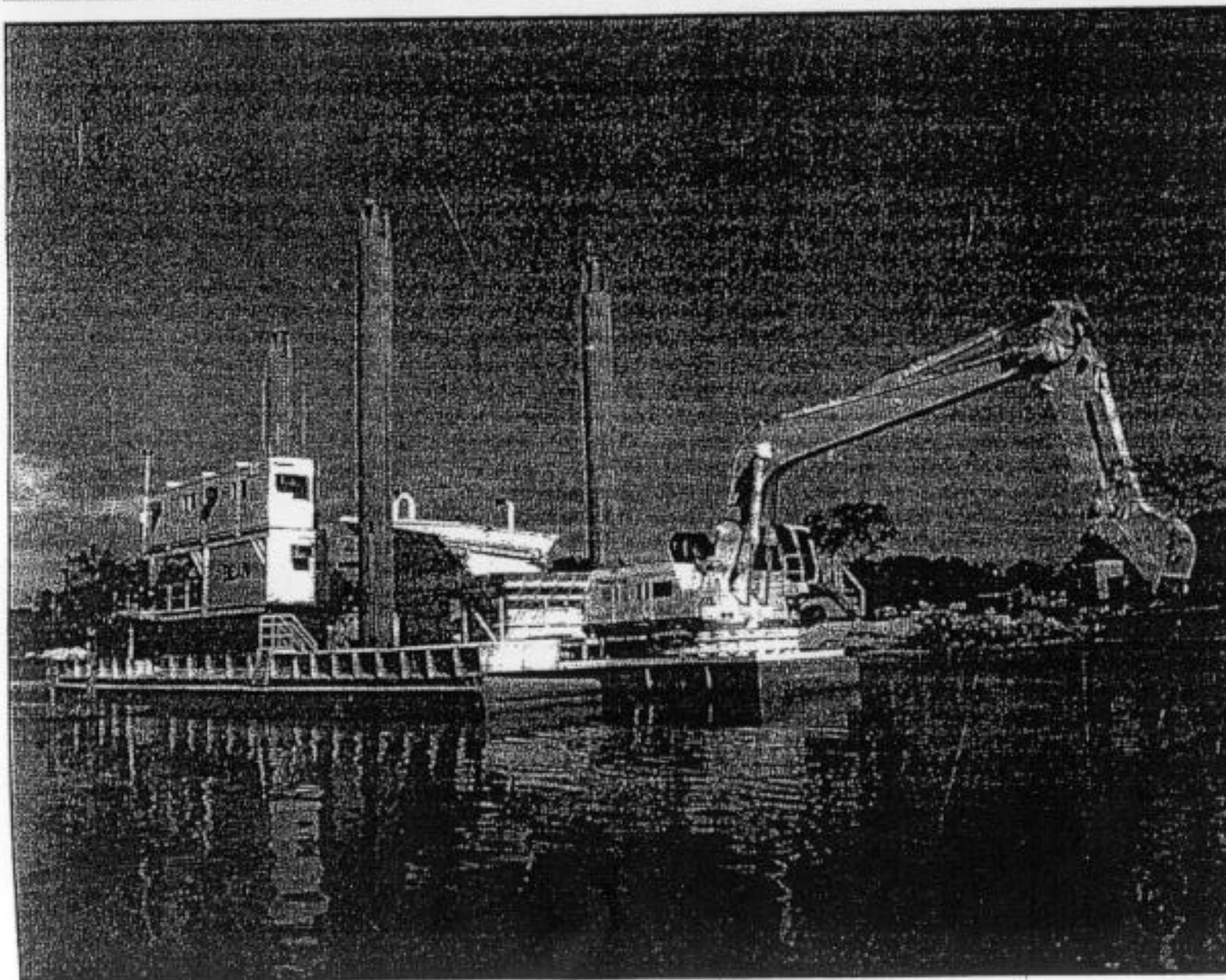
Boskalis has successfully used the profiling grab on numerous clean-up projects in the Netherlands, at Elburg, Wemeldinge, Terneuzen and Tiel, and on the Zuid-Willemsvaart canal.



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# THE UNIQUE BONACAVOR



What once was a beautiful southeastern Louisiana, turned into an environmental disaster. A creosote plant operating on the banks of Bayou Bonfouca since 1892, burned down in 1970 - spilling large amounts of toxic creosote into the bayou. By the 1980's, the spill had contaminated over 55 acres of bottom material. The site was subsequently placed on the EPA's Superfund priorities list, and has since become the largest Superfund Project ever awarded.

The specifications for the "Bayou Bonfouca Superfund Remediation Project" required an extremely narrow excavation tolerance. Such extreme tolerances were necessary in order to reduce or eliminate overdredging, and hold the quantity and cost of sediment treatment to the project estimates. Another challenge presented was protecting personnel and property from exposure to the contaminated sediments during excavation and transportation to the treatment facility. In addition, the sediment treatment process required the removal of contaminated sediments in as close to *in situ* state as possible.

Bean responded to these challenges by designing and building the Bonacavor. With innovations in cutter location, dredge positioning, sediment processing and transportation, the Bonacavor and Bean successfully conquered the challenges presented at Bayou Bonfouca.

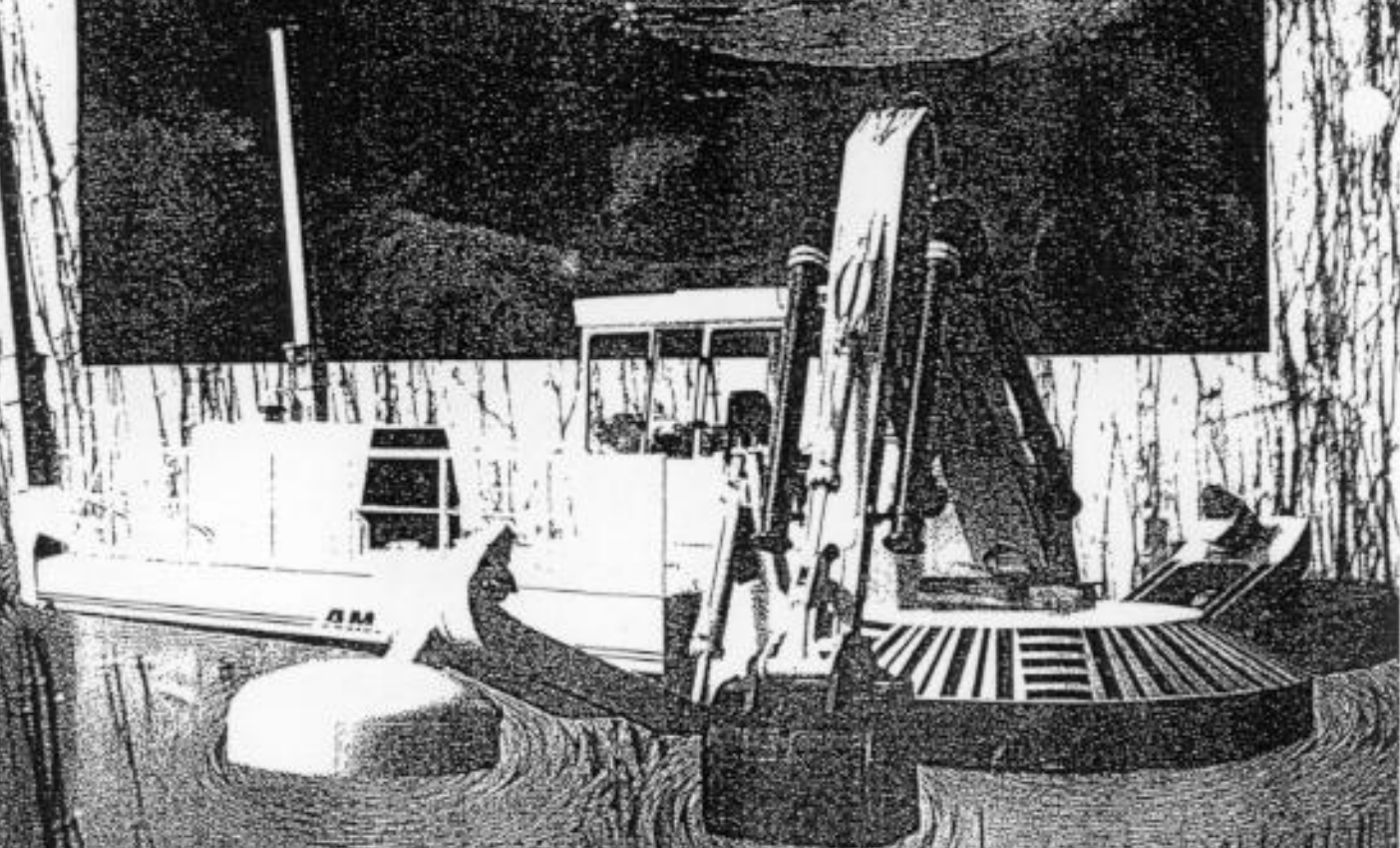
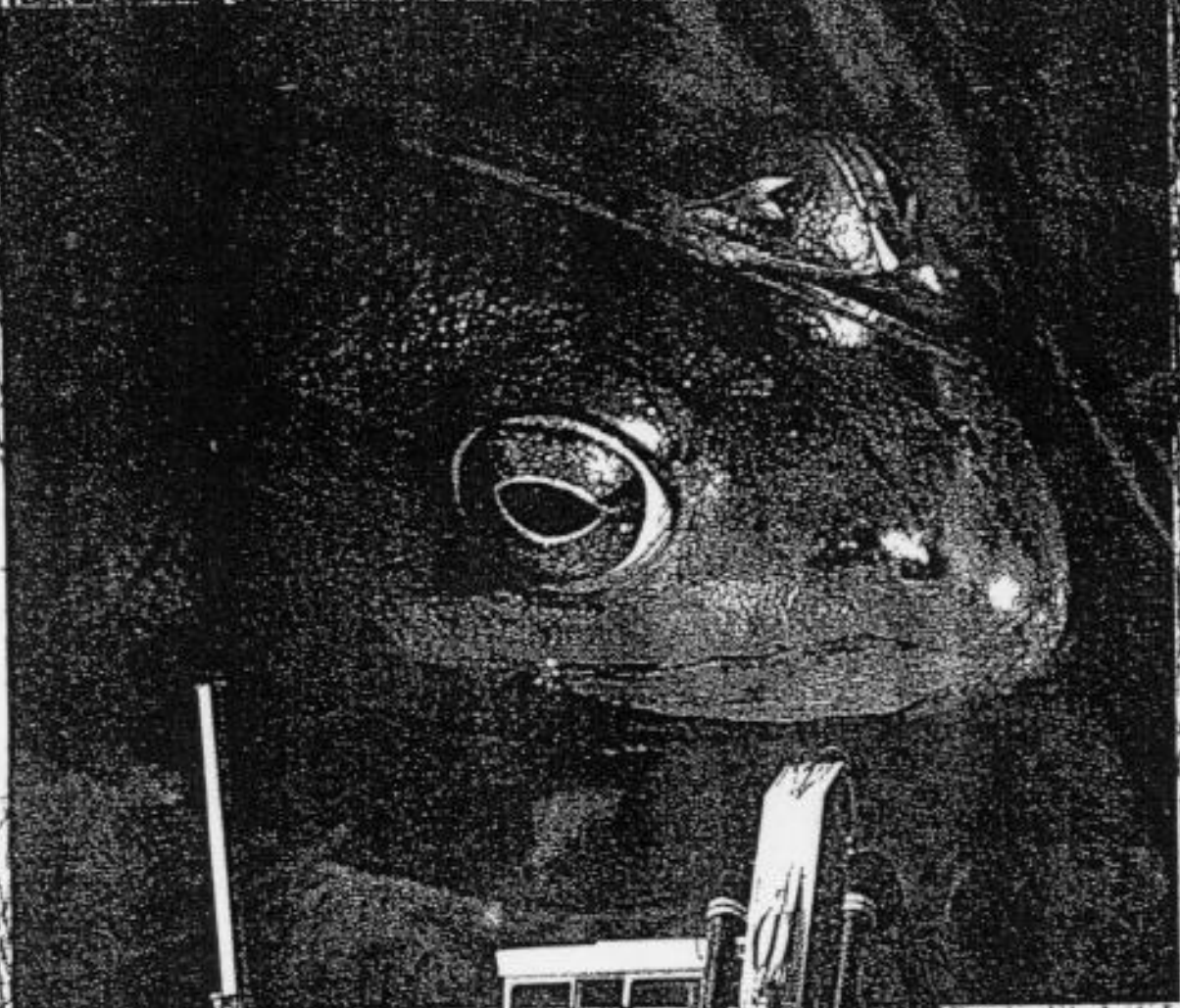
**BEAN**





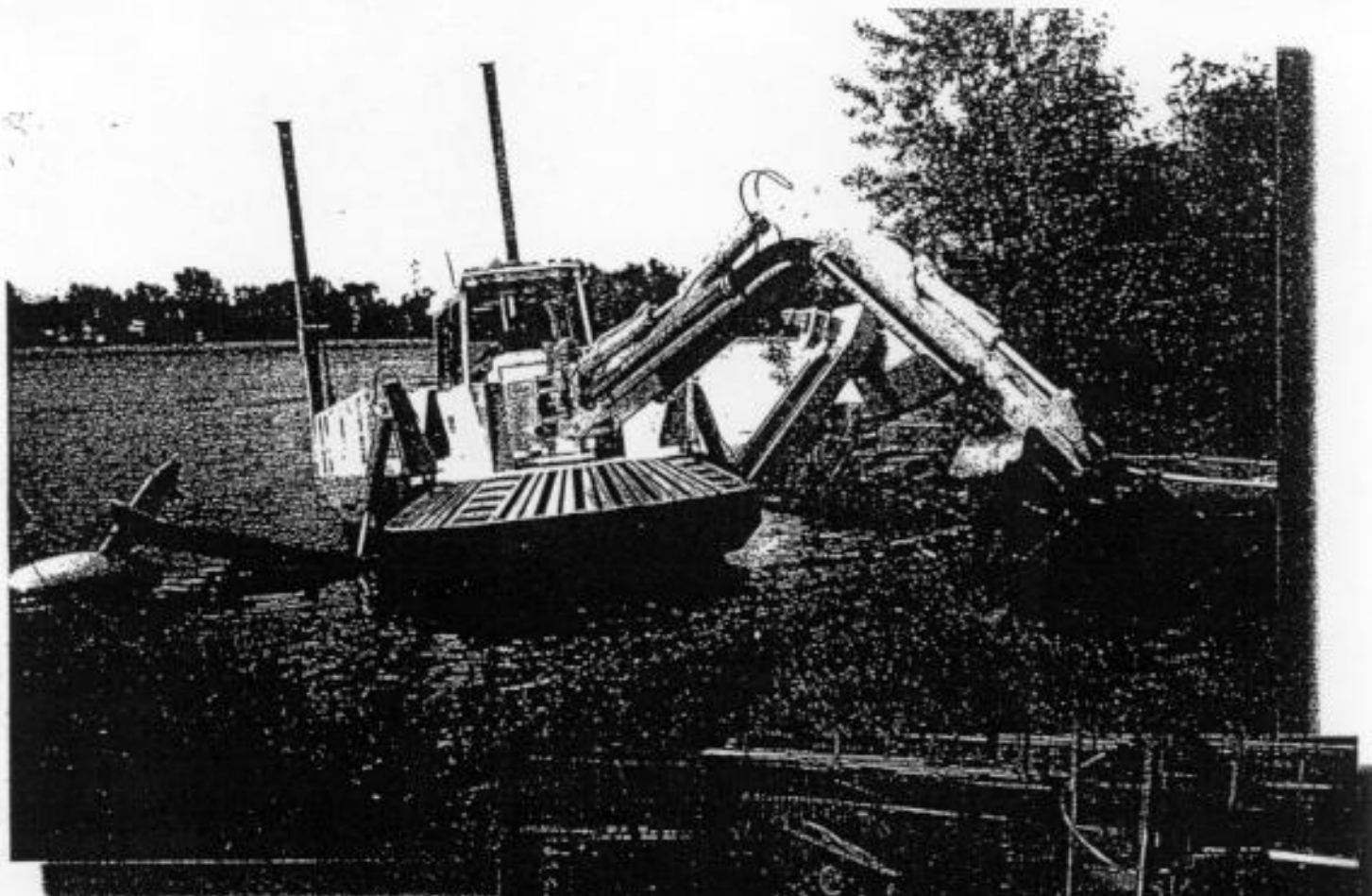
**FIGURE P-2. NORMROCK INDUSTRIES AMPHIBEX**

# Amphibex



DOING RIGHT BY NATURE



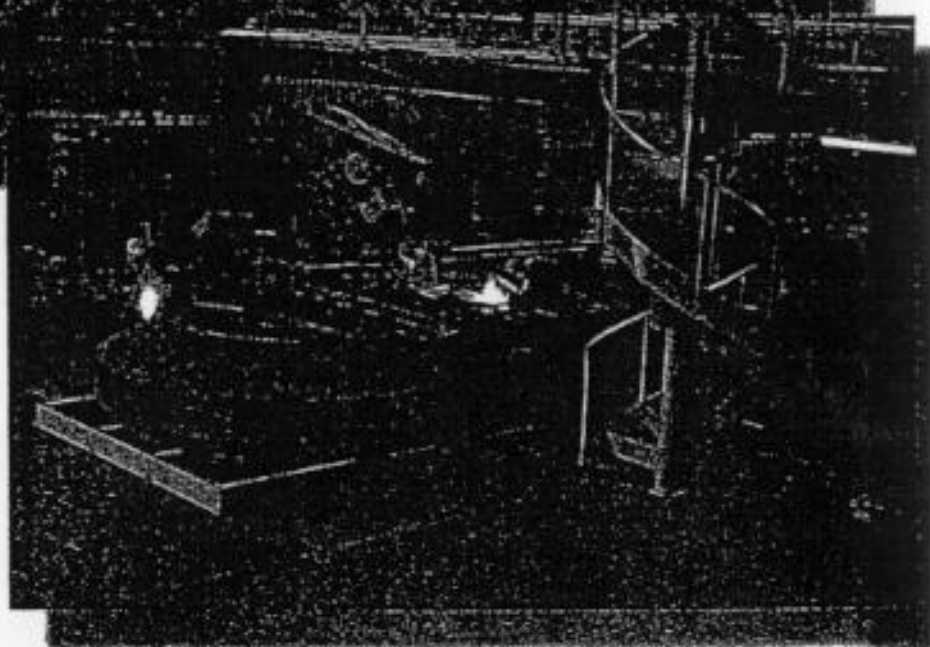


## Working with Nature

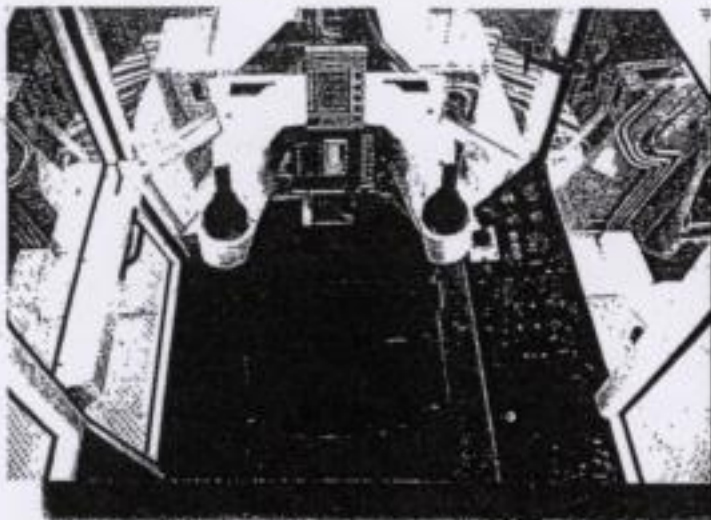
From time immemorial, humankind has used its ingenuity to exploit the planet's resources. But in these enlightened times, we also know that we must treat those resources with respect. The **Amphibex** from Normrock Industries is an amphibious excavator designed to meet both needs, wedding state-of-the-art performance with environmentally sound operation.

The culmination of many years of research and innovation, the **Amphibex** is an amphibious excavator specially designed to operate in an aquatic environment. What makes it different? Its versatility, power, ruggedness, mobility, sophisticated positioning equipment, and very low capital and operational costs.

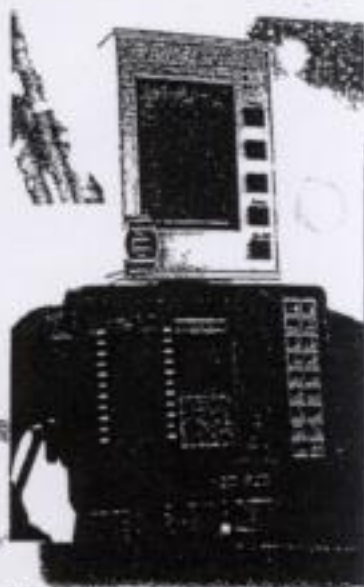
The Quebec-designed and built **Amphibex** is suitable for a wide range of uses in all types of water:



- cleaning and restoring contaminated waterways
- installing water pipes, pipelines and submarine cables
- cleaning wastewater treatment ponds
- preventing and breaking up ice jams
- controlling vegetation
- developing peat lands
- creating wildlife habitats



The Amphibex's cab meets the highest standards of comfort and visibility. It is equipped with two deluxe seats, easy-to-reach controls, side windows that can be opened, and a range of standard and optional accessories.



The Amphibex's optional sophisticated positioning system, developed by Normrock Industries, is particularly useful for clean-up operations. It can pinpoint the exact location where the machine is to set to work, by night or day. A graphical display system enables the operator to position the bucket with a high degree of precision.

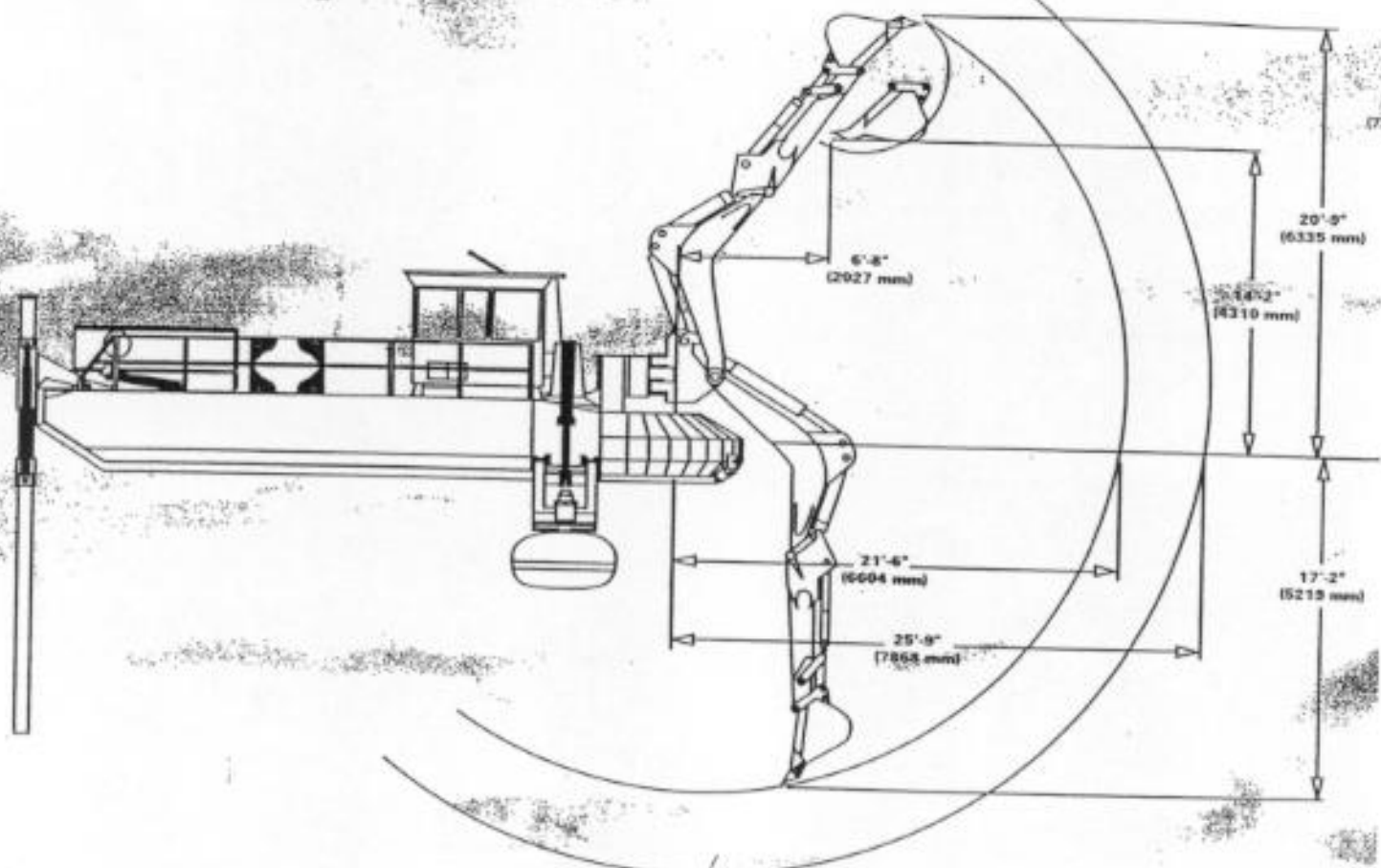


The Amphibex's powerful hydraulic pumping system can pump highly concentrated solid residues over distances of more than one kilometre.

The Amphibex can be equipped with an array of accessories (bucket, cutterhead-equipped pump bucket, rake, etc.) to enable it to perform the job at hand.



# Technical Specifications



## General Description

|                            |                                      |
|----------------------------|--------------------------------------|
| Maximum length             | 35' 7" (10.85 m)                     |
| Working weight             | appx. 24.25 tons<br>(22 metric tons) |
| Transport length           | 42' 2" (12.85 m)                     |
| Transport width            | 11' 6" (3.5 m)                       |
| Transport height           | 10' 6" (3.2 m)                       |
| Sailing speed              | appx. 8 knots                        |
| Stabilizers (rear) Draught | 2' (60 cm)                           |

## Engine

|                |   |
|----------------|---|
| Model          | Detroit diesel, Series 40   |
| Cylinders      | see options   |
| Maximum HP     | 6   |
| Maximum torque | 170 to 300  |
| Air compressor | 170-150 (15.1 NM) at 1700 rpm<br>140-120 (12.9 NM) at 1300 rpm<br>6.2 (5.4) 13 c. l. m. |

## Electrical

|               |                                  |
|---------------|----------------------------------|
| Starter       | 12 volt, air Delco/Remy 24 volts |
| Alternator    | Delco/Remy 42 volts              |
| Batteries (2) | Delco/Remy 100 amp               |
|               | Delco/Remy 225 amps/hr           |

Fuel Tank Capacity 117 (50) 1200 L

## Hydraulics

|   |                     |
|---|---------------------|
| 2 Gear pump                             | 90 gal (340 L)/min. |
| Maximum working pressure                | 240 bar             |
| Variable displacement pump              |                     |
| Maximum working pressure                | 450 bar             |
| Hydraulic system capacity               | 132.09 gal (500 L)  |
| Hydraulic oil vegetable base or mineral |                     |

## Standard Equipment

- Corrosion resistant one-piece body divided into nine watertight compartments
- Two rear stabilizers equipped with hydraulic tilting cylinders. Depth control by means of hydraulic cylinder/mechanical control
- Two front stabilizers with detachable floats and removable spuds
- Propulsion system hydraulically height controlled
- Flower fire extension, sec. opp. of 5 (5.12 kg)
- Excavator equipped with hydraulic dumping bucket and discharge line located on mud cast
- Output connection SAE 200 (2 X 3) gal/s (2 X 125 L/s) - bucket with horizontal cutter
- Quick coupling for working attachment
- Life saving equipment

## Excavator

|                                   |   |
|-----------------------------------|---|
| Maximum bucket reach              | 21' 6" (6.6 m) to 25' 9" (7.8 m) through 180° |
| Maximum depth with telescopic arm | 21' 5" (6.528 m)                              |
| Breakout force (from bucket cyl.) | depends on selection                          |
| Digging force (from bucket cyl.)  | depends on selection                          |

## Optional Equipment

- Backhoe buckets, 0.5 yd<sup>3</sup> (400 L) and 1 yd<sup>3</sup> (800 L)
- Discharge spout for side casting
- Rake - width 3' 11" (3 m)
- Discharge pipe - 8" (200 mm) X 20' (6 m) with aluminum mounting flanges (SAE200) connected float pipes
- Air compressor, hydraulically driven for accessories
- Navigation and dredging lights, telescopic and fu mast
- Winch
- Crane
- Tools
- Heating system
- Air conditioning

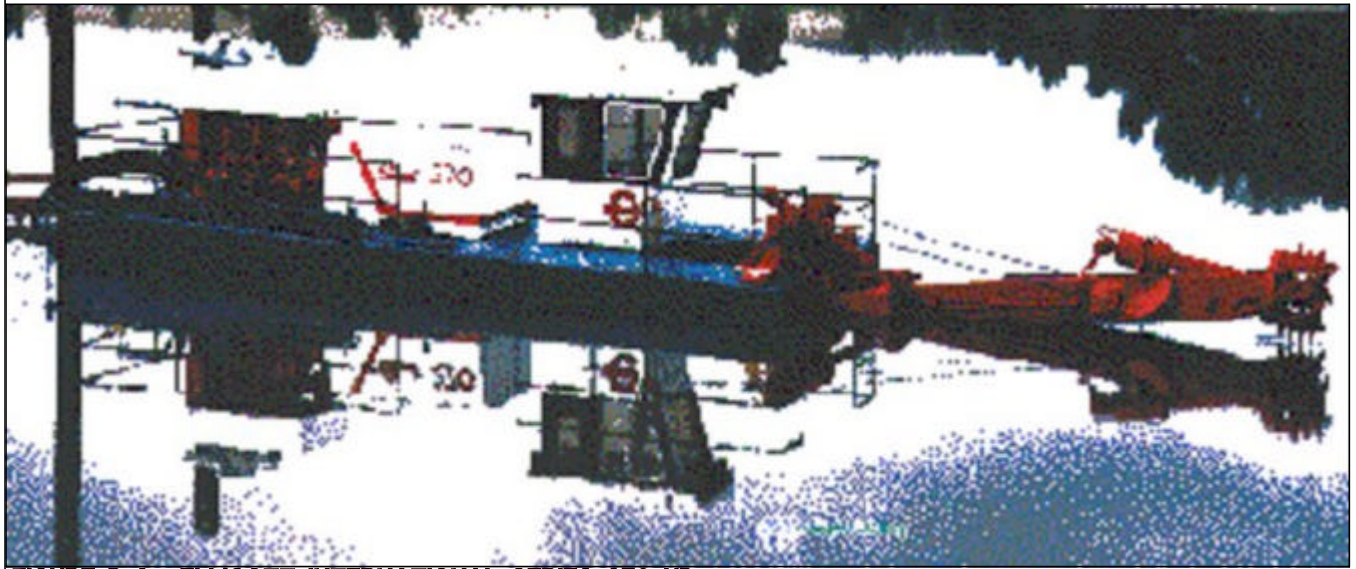
\* American gallon

For customized equipment for your special needs, please consult manufacturer.

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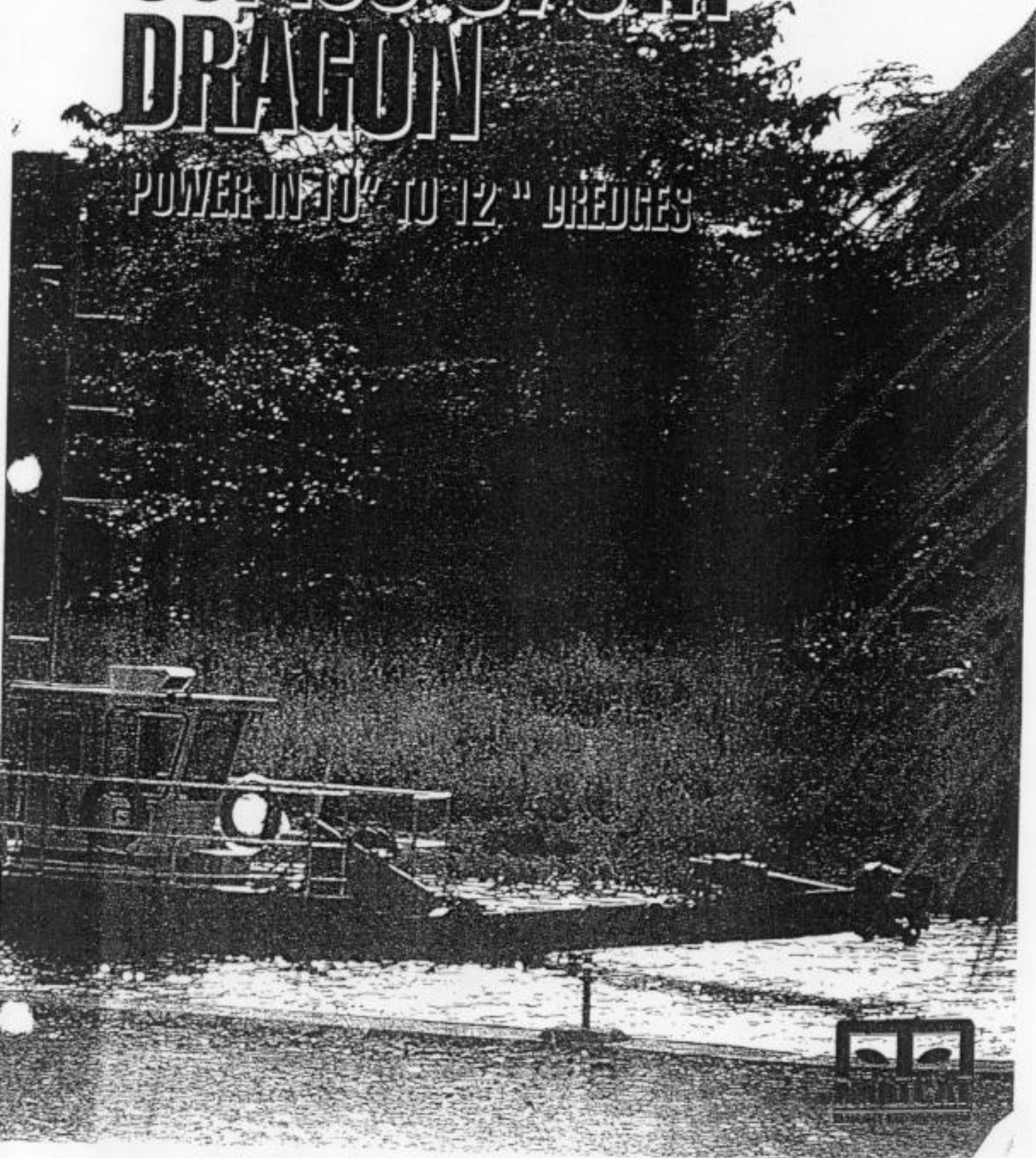


**FIGURE P-3. ELLICOTT INTERNATIONAL SERIES 370 HP**

*THE NEW ELLICOTT*

# Series 370HP DRAGON

POWER IN 10" TO 12" CREEDGES





## **STANDARD SPECIFICATIONS SERIES 370HP**

### **GENERAL**

|                              |          |           |
|------------------------------|----------|-----------|
| Overall Length (with ladder) | 17.5 m   | 57.5 feet |
| Overall Width                | 3.7 m    | 12.0 feet |
| Hull Depth                   | 1.2 m    | 4.0 feet  |
| Mean Draft (with fuel)       | 0.81 m   | 2.67 feet |
| Spud Length                  | 8.9 m    | 29.1 feet |
| Spud Weight (each)           | 816 kg   | 1800 lb.  |
| Total Dredge Dry Weight      | 25400 kg | 56000 lb. |
| Suction Pipe Diameter        | 305 mm   | 12 in.    |
| Discharge Pipe Diameter      | 254 mm   | 10 in.    |

### **OPERATING CONDITIONS**

|                      |       |           |
|----------------------|-------|-----------|
| <b>Digging Depth</b> |       |           |
| Minimum              | 0.9 m | 3.0 feet  |
| Maximum              | 6.1 m | 20.0 feet |

### **Maximum Channel Cut of Dredge**

|                         |        |           |
|-------------------------|--------|-----------|
| ① Minimum Digging Depth | 22.2 m | 73.0 feet |
| ② Maximum Digging Depth | 18.3 m | 60.0 feet |

### **PRIME MOVER**

|                                 |             |             |
|---------------------------------|-------------|-------------|
| Diesel Engine (radiator cooled) | Caterpillar | Caterpillar |
| Model                           | 3406 B      | 3406 B      |
| Maximum Operating RPM           | 1800        | 1800        |
| Continuous Power (flywheel)     | 306 kW      | 410 SHP     |

### **SWING WINCHES**

|                          |            |          |
|--------------------------|------------|----------|
| Line Pull (1st layer)    | 3629 kg    | 8000 lb. |
| Line Speed (1st layer)   | 22.9 m/min | 75 FPM   |
| Wire Size                | 12.7 mm    | 1/2 in.  |
| Drum Capacity (maximum)  | 91 m       | 300 feet |
| Drum Capacity (standard) | 61 m       | 200 feet |

### **CUTTER MODULE**

|  |            |             |
|--|------------|-------------|
| Cutter Force                             | 1787 kg    | 3940 lb.    |
| Cutting Force (per unit length of blade) | 34.3 kg/cm | 192 lb./in. |
| Cutter Diameter                          | 800 mm     | 31.5 in.    |
| Cutter Rating                            | 30 kW      | 40.0 SHP    |
| Cutter Speed                             | 0-39 RPM   | 0-39 RPM    |
| Number of Blades                         | 6          | 6           |

### **SLURRY PUMP**

|                    |        |            |
|--------------------|--------|------------|
| Impeller Diameter  | 686 mm | 27 in.     |
| Particle Clearance | 152 mm | 6 in. dia. |
| Maximum RPM        | 845    | 845        |

### **LADDER HOIST CYLINDER**

|                          |            |           |
|--------------------------|------------|-----------|
| Extending Force          | 4452 kg    | 9815 lb.  |
| Retracting Force         | 18700 kg   | 41225 lb. |
| Lowering Speed at Cutter | 24.7 m/min | 81 FPM    |
| Hoisting Speed at Cutter | 29.6 m/min | 97 FPM    |

### **SPUD HOIST**

|                         |           |           |
|-------------------------|-----------|-----------|
| Lifting Force (at spud) | 3266 kg   | 7200 lb.  |
| Lowering Speed          | Free Fall | Free Fall |

### **ELECTRICAL SYSTEM**

|         |      |      |
|---------|------|------|
| Battery | 24 V | 24 V |
|---------|------|------|

### **CAPACITIES**

|               |             |          |
|---------------|-------------|----------|
| Fuel          | 3028 Liters | 800 gal. |
| Hydraulic Oil | 871 Liters  | 230 gal. |

Complete dredge outfitting equipment available including polyethylene pipeline and booster pumps.

### **CONVERSION FOR VARIOUS IN-SITU S.G.**

| DENSITY | MULTIPLIER |
|---------|------------|
| 2.10    | 1.000      |
| 2.00    | 1.100      |
| 1.95    | 1.158      |
| 1.90    | 1.222      |
| 1.85    | 1.294      |
| 1.80    | 1.375      |

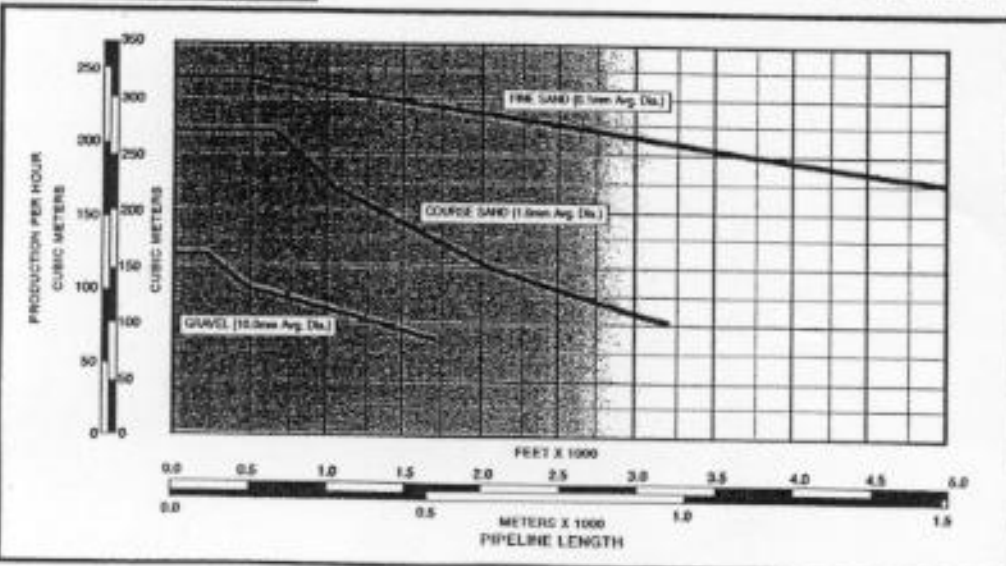
## **SERIES 370HP CALCULATED OUTPUT CURVES**

Material In-situ Density = 2.1

For material in-situ values other than 2.1, see conversion chart at left.

CALCULATED OUTPUT CURVES BASED ON 12-INCH (305 mm) PIPELINE:

- 12" (305mm) Diameter Suction
- 12" (305mm) Diameter Discharge
- 20' (6.09m) Digging Depth
- 10' (3.05m) Terminal Elevation
- 27" (685.8mm) Diameter Impeller
- Maximum RPM = 845 SHP = 320



Output curves for all applications are computer generated on a program specifically designed for this purpose. The calculated output curves represent our best engineering knowledge and reflect the output pumping capability of the dredge under the conditions stated. In actual practice, the material varies from free-flowing, easily excavated material, to compacted and/or difficult excavations. The nature of the material and job conditions must be considered when estimating actual outputs. The outputs are indicated for your reference and are not guaranteed.

### **WARRANTY**

Ellicott warrants its equipment only in accordance with its printed warranty conditions, the latest copy of which will be forwarded to you promptly upon written request. No other warranties are provided.

The specifications shown in this brochure are subject to change due to improvements or design modifications required during construction, or the addition of equipment not described in the specifications.